



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

NOTICE OF ALLOWANCE AND FEE(S) DUE

20529

7590

02/18/2009

THE NATH LAW GROUP
112 South West Street
Alexandria, VA 22314

EXAMINER

ALUNKAL, THOMAS D

ART UNIT

PAPER NUMBER

2627

DATE MAILED: 02/18/2009

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/538,488	06/09/2005	Junichiro Tonomi	26817U	7096

TITLE OF INVENTION: OPTICAL DISK UNIT AND ABERRATION CORRECTING METHOD USED FOR THIS

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1510	\$300	\$0	\$1810	05/18/2009

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. **PROSECUTION ON THE MERITS IS CLOSED.** THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN **THREE MONTHS** FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. **THIS STATUTORY PERIOD CANNOT BE EXTENDED.** SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: Mail **Mail Stop ISSUE FEE**
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax **(571)-273-2885**

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

20529 7590 02/18/2009
THE NATH LAW GROUP
 112 South West Street
 Alexandria, VA 22314

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/538,488 06/09/2005

Junichiro Tonami

26817U

7096

TITLE OF INVENTION: OPTICAL DISK UNIT AND ABERRATION CORRECTING METHOD USED FOR THIS

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
-------------	--------------	---------------	---------------------	----------------------	------------------	----------

nonprovisional

NO

\$1510

\$300

\$0

\$1810

05/18/2009

EXAMINER	ART UNIT	CLASS-SUBCLASS
----------	----------	----------------

ALUNKAL, THOMAS D

2627

369-044230

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. Use of a **Customer Number is required.**

2. For printing on the patent front page, list

(1) the names of up to 3 registered patent attorneys or agents OR, alternatively,

1

(2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

2

3

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

☐ Issue Fee

☐ Publication Fee (No small entity discount permitted)

☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): (Please first reapply any previously paid issue fee shown above)

☐ A check is enclosed.

☐ Payment by credit card. Form PTO-2038 is attached.

☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)

☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27.

☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____

Date _____

Typed or printed name _____

Registration No. _____

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/538,488

06/09/2005

Junichiro Tonami

26817U

7096

20529

7590

02/18/2009

THE NATH LAW GROUP

112 South West Street
Alexandria, VA 22314

EXAMINER

ALUNKAL, THOMAS D

ART UNIT

PAPER NUMBER

2627

DATE MAILED: 02/18/2009

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 617 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 617 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

Notice of Allowability**Application No.**

10/538,488

Examiner

THOMAS D. ALUNKAL

Applicant(s)

TONAMI, JUNICHIRO

Art Unit

2627

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to amendment after final filed 1/27/09.
2. ☒ The allowed claim(s) is/are 2-4,6-9,12-14, and 16-19 (renumbered 1-14).
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some* c) ☐ None of the:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
(a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
(b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

/Thomas D Alunkal/
Examiner, Art Unit 2627

/Wayne Young/
Supervisory Patent Examiner, Art Unit 2627

DETAILED ACTION

Response to Arguments

Applicant's arguments, see Remarks, filed 1/27/09, with respect to pending claims 2-4, 6-9, 12-14, and 16-19 have been fully considered and are persuasive. The previous grounds of rejection have been withdrawn.

Claims 2, 3, 6-9, 12, 13, and 16-19 were objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form, as indicated in the Office Action dated 11/26/08. In response to the objections, claims 2, 6, 8, 9, 12, 16, 18, and 19 have been amended to include all of the limitations of the base claim and any intervening claims. Pending claims 2-4, 6-9, 12-14, and 16-19 are now in condition for allowance.

EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Sung Yeop Chung on 2/9/09.

In the Claims:

In claim 2, please replace the recitation "...a recorder capable of recording a random signal having a plurality of amplitudes and periods in the area of the information

*recording layer if the **detector** determines that the information recording layer has no record to reproduce a random signal by the detector..." with -- a recorder capable of recording a random signal having a plurality of amplitudes and periods in the area of the information recording layer if the **determiner** determines that the information recording layer has no record to reproduce a random signal by the detector--.*

In claim 6, please replace the recitation "...allowing the reproducer to reproduce a random signal having a plurality of amplitudes and periods from the **optional** area of the information recording layer..." with -- allowing the reproducer to reproduce a random signal having a plurality of amplitudes and periods from the area of the information recording layer --.

In claim 8, please replace the recitation "...allowing the reproducer to reproduce a random signal having a plurality of amplitudes and periods from the **optional** area of the information recording layer..." with -- allowing the reproducer to reproduce a random signal having a plurality of amplitudes and periods from the area of the information recording layer --.

In claim 9, please replace the recitation "...allowing the reproducer to reproduce a random signal having a plurality of amplitudes and periods from the **optional** area of the information recording layer..." with -- allowing the reproducer to reproduce a random signal having a plurality of amplitudes and periods from the area of the information recording layer --.

In claim 12, please replace the recitation "...a reproducing step of reproducing a random signal having a plurality of amplitudes and periods from an **optional** area of an

information recording layer of an optical disk..." with -- a reproducing step of reproducing a random signal having a plurality of amplitudes and periods from an area of an information recording layer of an optical disk --.

Allowable Subject Matter

Claims 2-4, 6-9, 12-14, and 16-19 are allowed.

The following is an examiner's statement of reasons for allowance: The prior art taken either singularly or in combination fails to anticipate or fairly suggest the limitations of the independent claims 2, 6, 8, 9, 12, 16, 18, and 19.

Regarding claim 2, the prior art taken either singularly or in combination fails to anticipate or fairly suggest an optical disk unit having reproducer for reproducing information recorded in an information recording layer of an optical disk, comprising: a laser beam source; an aberration corrector to correct a spherical aberration by adjusting the diverging or converging angle of a laser beam emitted from the laser beam source; an objective lens to condense the laser beam and form a condensed beam spot on the information recording layer; a focus controller having a moving mechanism to move the objective lens along an optical axis of the laser beam, the focus controller moving the objective lens so that the condensed beam spot focuses on the information recording layer; a detector capable of for allowing the focus controller to move the objective lens by a predetermined distance from an in-focus position in a first direction, allowing the reproducer to reproduce a random signal having a plurality of amplitudes and periods from an optional area of the information recording layer, extracting a specific portion

having a specific amplitude or period from the reproduced random signal or an interpolated signal thereof, finding a first amplitude value in the specific portion, allowing the focus controller to move the objective lens by the predetermined distance from the in-focus position in a second direction that is opposite to the first direction, allowing the reproducer to reproduce a random signal having a plurality of amplitudes and periods from the area of the information recording layer, extracting a specific portion having a specific amplitude or period from the reproduced random signal or an interpolated signal thereof, and finding a second amplitude value from the specific portion; and a control unit capable of controlling the aberration corrector so that the difference between the first amplitude value and the second amplitude value approaches zero; ***a determiner capable of determining whether or not the information recording layer has a record to reproduce a random signal by the detector; and a recorder capable of recording a random signal having a plurality of amplitudes and periods in the area of the information recording layer if the determiner determines that the information recording layer has no record to reproduce a random signal by the detector.***

Regarding claim 6, the prior art taken either singularly or in combination fails to anticipate or fairly suggest an optical disk unit having a reproducer for reproducing information recorded in an information recording layer of an optical disk, comprising: a laser beam source; an aberration corrector to correct a spherical aberration by adjusting the diverging or converging angle of a laser beam emitted from the laser beam source; an objective lens to condense the laser beam and form a condensed beam spot on the

information recording layer; a focus controller having a moving mechanism to move the objective lens along an optical axis of the laser beam, the focus controller moving the objective lens so that the condensed beam spot focuses on the information recording layer; a detector for allowing the focus controller to move the objective lens by a predetermined distance from an in-focus position in a first direction, allowing the reproducer to reproduce a random signal having a plurality of amplitudes and periods from an optional area of the information recording layer, extracting a first specific portion having a first specific amplitude or period and a second specific portion having a second specific amplitude or period from the reproduced random signal or an interpolated signal thereof, finding a first differential value between an amplitude value of the first specific portion and an amplitude value of the second specific portion, allowing the focus controller to move the objective lens by the predetermined distance from the in-focus position in a second direction that is opposite to the first direction, allowing the reproducer to reproduce a random signal having a plurality of amplitudes and periods from the optional area of the information recording layer, extracting a third specific portion having a third specific amplitude or period and a fourth specific portion having a fourth specific amplitude or period from the reproduced random signal or an interpolated signal thereof, and finding a second differential value between an amplitude value of the third specific portion and an amplitude value of the fourth specific portion; and a control unit capable of controlling the aberration corrector so that the difference between the first differential value and the second differential value approaches zero; ***a determiner capable of determining whether or not the information recording layer has a***

record to reproduce a random signal by the detector; and a recorder capable of recording a random signal having a plurality of amplitudes and periods in the area of the information recording layer if the determiner determines that the information recording layer has no record to reproduce a random signal by the detector.

Regarding claim 8, the prior art taken either singularly or in combination fails to anticipate or fairly suggest an optical disk unit having a reproducer for reproducing information recorded in an information recording layer of an optical disk, comprising: a laser beam source; an aberration corrector to correct a spherical aberration by adjusting the diverging or converging angle of a laser beam emitted from the laser beam source; an objective lens to condense the laser beam and form a condensed beam spot on the information recording layer; a focus controller having a moving mechanism to move the objective lens along an optical axis of the laser beam, the focus controller moving the objective lens so that the condensed beam spot focuses on the information recording layer; a detector for allowing the focus controller to move the objective lens by a predetermined distance from an in-focus position in a first direction, allowing the reproducer to reproduce a random signal having a plurality of amplitudes and periods from an optional area of the information recording layer, extracting a first specific portion having a first specific amplitude or period and a second specific portion having a second specific amplitude or period from the reproduced random signal or an interpolated signal thereof, finding a first differential value between an amplitude value of the first specific portion and an amplitude value of the second specific portion, allowing the focus

controller to move the objective lens by the predetermined distance from the in-focus position in a second direction that is opposite to the first direction, allowing the reproducer to reproduce a random signal having a plurality of amplitudes and periods from the optional area of the information recording layer, extracting a third specific portion having a third specific amplitude or period and a fourth specific portion having a fourth specific amplitude or period from the reproduced random signal or an interpolated signal thereof, and finding a second differential value between an amplitude value of the third specific portion and an amplitude value of the fourth specific portion; and a control unit capable of controlling the aberration corrector so that the difference between the first differential value and the second differential value approaches zero, ***wherein the detector comprises: a zero-cross detector capable of detecting a zero-cross point where the reproduced random signal or an interpolated signal thereof crosses a preset zero level; a time interval detector capable of detecting a time interval between two adjacent zero-cross points; and an extractor capable of extracting the first to fourth specific portions according to time intervals detected by the time interval detector.***

Regarding claim 9, the prior art taken either singularly or in combination fails to anticipate or fairly suggest an optical disk unit having a reproducer for reproducing information recorded in an information recording layer of an optical disk, comprising: a laser beam source; an aberration corrector to correct a spherical aberration by adjusting the diverging or converging angle of a laser beam emitted from the laser beam source; an objective lens to condense the laser beam and form a condensed beam spot on the

information recording layer; a focus controller having a moving mechanism to move the objective lens along an optical axis of the laser beam, the focus controller moving the objective lens so that the condensed beam spot focuses on the information recording layer; a detector for allowing the focus controller to move the objective lens by a predetermined distance from an in-focus position in a first direction, allowing the reproducer to reproduce a random signal having a plurality of amplitudes and periods from an optional area of the information recording layer, extracting a first specific portion having a first specific amplitude or period and a second specific portion having a second specific amplitude or period from the reproduced random signal or an interpolated signal thereof, finding a first differential value between an amplitude value of the first specific portion and an amplitude value of the second specific portion, allowing the focus controller to move the objective lens by the predetermined distance from the in-focus position in a second direction that is opposite to the first direction, allowing the reproducer to reproduce a random signal having a plurality of amplitudes and periods from the optional area of the information recording layer, extracting a third specific portion having a third specific amplitude or period and a fourth specific portion having a fourth specific amplitude or period from the reproduced random signal or an interpolated signal thereof, and finding a second differential value between an amplitude value of the third specific portion and an amplitude value of the fourth specific portion; and a control unit capable of controlling the aberration corrector so that the difference between the first differential value and the second differential value approaches zero; ***wherein the detector comprises: a zero-cross detector capable of detecting a zero-cross point***

where the reproduced random signal or an interpolated signal thereof crosses a preset zero level; a partial response determiner capable of using zero-cross points detected by the zero-cross detector and the reproduced signal or an interpolated signal thereof, to determine a target value for each sampling point of the reproduced random signal or an interpolated signal thereof according to run-length limitation and state transition determined by partial response characteristics; and an extractor capable of extracting the first to fourth specific portions according to target values determined by the partial response determiner.

Method claims 12, 16, 18, and 19 are drawn to the method of using the corresponding apparatus claimed in claims 2, 6, 8, and 9, respectively. Therefore method claims 12, 16, 18, and 19 correspond to apparatus claims 2, 6, 8, and 9, respectively, and are allowed for the same reasons as indicated above.

Dependent claims 3, 4, 7, 13, 14, and 17 are allowed with their respective base claims.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Yasuda et al. (US PgPub 2002/0150016) discloses an optical disk apparatus. Kim et al. (US PgPub 2002/0101798) discloses an optical pickup capable of detecting and/or compensating for spherical aberration. Tateishi (US PgPub 2003/0007431) discloses a multi-layer disk recording/reproducing apparatus and focus jump method. Yasuda et al. (US 7, 277,36) discloses an optical information processing apparatus and method of processing optical information. Arai et al. (US 7,151,735) discloses an optical pickup apparatus. Nakano et al. (US 6,728,179) discloses an apparatus and method for optical recording. Kim et al. (US 7,020,055) discloses an optical pickup apparatus. Ando et al. (US PgPub 2002/0060958) discloses an optical information processing system using optical aberrations.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to THOMAS D. ALUNKAL whose telephone number is (571)270-1127. The examiner can normally be reached on M-F 7:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wayne Young can be reached on (571)272-7582. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Thomas D Alunkal/
Examiner, Art Unit 2627

/Wayne Young/
Supervisory Patent Examiner, Art Unit 2627